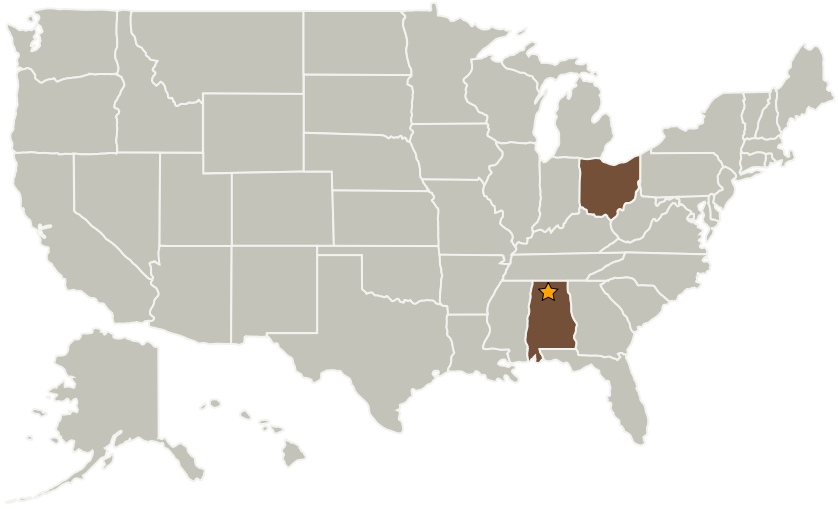
High Toughness Light Weight Pressure Vessel, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

Proposed is a pressure vessel with 25% better Fracture Strength over equal strength designed Fiberglass to help reduce 10 to 25% weight for aerospace use. Phase I is a proof-of-concept to make a 4? diameter x 24? long cylindrical vessel. Phase II will make 12? or larger diameter x 48? long vessels. The vessel will be used to store compressed gases and liquids for aerospace applications where impact damage is a possibility. A pressure vessel has openings for nozzles etc. Fracture toughness (KIC) and strength are both used to design a safe vessel which would meet leak-before-fail and other conditions. In the proposed innovation high toughness 580 KSI (4000 MPa) steel wires woven in net shape will be used. Wire counts are proportional to transverse and longitudinal stresses and a polymer covers the net. The ends are uniquely overlapped to preserve maximum strength. Cost is substantially low.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
N&R Engineering	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Parma Heights, Ohio

Primary U.S. Work Locations	
Alabama	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Amit Prakash

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.2 Extravehicular Activity Systems
    - TX06.2.1 Pressure Garment